

Parental Education on Fissure Sealant: A Literature Review

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Abstract

Background and Aim: Fissure sealant therapy is one of the most effective strategies to prevent dental caries. Sealants fill the occlusal grooves of the posterior teeth and prevent the accumulation of microorganisms and subsequent development of caries as such. This study aimed to evaluate parental education on fissure sealant therapy.

Materials and Methods: A search was conducted in seven international databases or websites including BioMed Central, Google Scholar, PubMed, ProQuest, and Scopus, and two national databases (SID and Magiran) for relevant articles on the Iranian population published between 2011 and 2021. Of a total of 3,980 articles retrieved by the initial search, 7 articles were selected with experimental and quasi-experimental designs. The interventions were in the form of educational programs with follow-up sessions, examinations, and preventive services at different times. The variables included knowledge, attitude, self-efficacy, fissure sealant, and dental caries.

Results: All the tested variables significantly changed after the educational intervention.

Conclusion: According to the results of the reviewed interventional studies in Iran, instruction of oral health-promoting behaviors and fissure sealant therapy to parents has a positive effect on the practice of the parents concerning fissure sealant therapy. It also appears that interventions based on theoretical education and changing behavioral models can be effective in promoting oral health practice.

Keywords: Pit and Fissure Sealants; Dentition, Permanent; Prenatal Education

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Introduction

Dental caries is one of the most common infectious and preventable diseases in children and adolescents worldwide [1]. It may have adverse effects on physical health and imposes high costs on the society. Genetic factors, poor nutrition, and poor oral hygiene are the most

effective factors in development of dental caries [2].

Fluoride therapy and oral hygiene can decrease the severity of smooth-surface caries, but the occlusal surface of the teeth is highly susceptible to caries due to its morphological shape [3]. The occlusal surface of the teeth

comprises about 12% of the total tooth surfaces, and 80-90% of dental caries occur in the occlusal surface. Permanent posterior teeth have thin and deep occlusal grooves that are suitable for entrapment of bacteria and food debris, resulting in caries development [4]. Fissure sealant therapy is an effective method to prevent occlusal caries. Sealing of the pits and fissures prevents accumulation of microorganisms and subsequent development of dental caries in children [4].

Despite the obvious efficacy of fissure sealant therapy in prevention of dental caries, its application has not yet become widespread, and the prevalence rate of fissure sealant therapy is about 47% worldwide and lower in developing countries such as Iran [5]. Health education is one of the most basic and easiest ways to link awareness to practice and is the best way to prevent oral diseases. In children, the first posterior teeth erupt around 6 to 7 years of age; thus, this age is the best time for fissure sealant treatment [6]. Children at this age are not highly capable of using preventive measures, and parents are responsible for the physical and mental health of their children. Necessary training for the parents is therefore required in this regard [7].

The effectiveness of educational interventions has been previously confirmed [8]. Review studies and original studies on health promotion interventions can serve as a guide for future decisions [9-11]. The aim of this study was to assess parental education on fissure sealant therapy.

Materials and Methods

In this review study, articles related to fissure sealants conducted in Iran and published between 2011 and 2021 were searched in seven databases and websites including BioMed Central, Google Scholar, PubMed, ProQuest, and Seer and two national databases (SID and Magiran) using the related keywords. Seven articles were selected.

The criteria for article selection were as follows:

- A: Interventional studies (experimental and quasi-experimental)
- B: Studies on parents and preschool teachers in contact with children aged 6 to 8 years, as the target group and participants.
- C: The measured variables in the study had to be the level of practice, knowledge and attitude of the participants
- D: Articles in English and Persian, which were conducted in Iran

In the aforementioned databases, the search was performed as follows:

- A: Using filters [time (range between 2010 and 2021) and correlation of studies with the desired keywords]
- B: Use of Boolean operators (AND/OR).

The keywords used in this review were classified into three general groups:

- Group 1: Dental fissure sealant (prevention of caries of the first posterior tooth)
- Group 2: Health education and health promotion (educational program, educational intervention).
- Group 3: Parents of children aged 6 to 9 years (preschool and elementary school)

Article related to fissure sealant therapy and educational interventions were considered to have appropriate quality. Articles with descriptive or ambiguous results were considered to have low quality (Figure 1).



Figure 1. Article selection based on the inclusion and exclusion criteria

Results

Out of 3,970 articles, 2,100 were duplicates and excluded; 1,870 articles were excluded due to the irrelevance of the title; 20 articles remained. After reading the abstracts, 13 articles with irrelevant abstracts and cross-sectional studies were excluded; 7 related articles were finally reviewed [8,12-17]. The educational intervention program included group training sessions with lectures, questions and answers, individual training, and face to face instruction.

In one study, group training sessions and lectures were used [12].

In one study, group training sessions with slides and pamphlets were held [13] (Table 1).

In one study, group meetings, lectures, pamphlets, brochures, and educational videos were used [8].

In one study, clinical dental examination of children's teeth was performed [14] (Table 1).

In one study, group training sessions, lectures, and practical demonstrations were used [15] (Table 1).

Table 1. Characteristics of the reviewed studies and summary of the effect of interventions on parental education and conduction of fissure sealant therapy

Authors	Type of intervention	Study design	Participants, contributors	Variables	Results
Einollahzadeh et al. (8) 2021 Sanandaj	Group training, pamphlets, brochures, videos	Experimental - interventional	Mothers of 6-year-old children (preschool)	Gender, age, education, income, occupation	In-person training was effective in increasing behavioral intention
Shirzad et al. (12), 2015 Tehran	Group training and questionnaire	Semi-experimental intervention	Mothers, preschool children, preschool teachers	Number of children, mother's education, father's education, mother's marital status, family income, mother's occupation, father's occupation	Educational intervention can reduce the perceived barriers of mothers to observe oral health in preschool children and increase their self-efficacy and positive attitude
Eslamipour et al. (13), 2011 Isfahan Amiri	Group training, questionnaire and pamphlet	Experimental clinical trial	Mothers of girls 6 to 9 years of age	Occupation, education, income, gender	Educating mothers can have a positive effect on their performance to go to the dentist and use fissure sealant services
Tehranizadeh (14) 2015 Zahedan	Historical retrospective	Historical retrospective	Children who underwent fissure sealant 3 years ago	Age, sex, time elapsed since fissure sealant therapy	The fissure sealant program has been successful in preventing occlusal caries
Peyman and Samiee Roudi [15] 2016 Khaf	Group training, lectures, practical demonstrations, questionnaires	Interventional - quasi-experimental	Fifth graders	Age, gender, height, family size, parents' education, parents' occupation, number of restored, filled, or missed teeth	Interventions based on educational models showed greater efficiency and effectiveness in achieving the goals of educating the community and changing behavior
Motlagh et al. (16), 2016 Amol	Group training, brushing using models and pamphlets	Clinical trial	Children, mothers, educators	Gender, age, mother's education, father's education	Brushing training significantly reduced dental plaque.
Bahmani et al. (17) 2021 Sanandaj	Group training, Pamphlets, brochures, educational videos, questionnaire	Experimental	Mothers of 6-year-old children (preschool)	Age, sex, occupation, education, place of residence, number of children	Educational intervention based on the theory of planned behavior on fissure sealant can help increase the fissure sealant rate.

In one study, training was conducted as a practical demonstration using a pamphlet [16] (Table 1).

In one study, training was conducted through distance education, pamphlets, brochures, and virtual networks [17] (Table 1).

Duration of training sessions varied across the studies and mostly ranged from 45 to 60 minutes [8,12,14,15,17]. In some studies [13,16], the duration of training was not mentioned. The follow-up time for the effect of interventions was different across studies. The minimum time was immediately after the intervention, and the maximum time was 3 months after the intervention.

In all studies, educational intervention was effective in preventing caries by fissure sealants. Among all the research variables, education of the parents, especially mothers, was the most successful, which caused an increase in knowledge and attitude and ultimately led to a reduction in dental caries of children. In addition to fissure sealant, fluoride therapy was the most commonly mentioned preventive measure in studies. Repeated use of fluoride therapy at regular intervals over 3 years showed an 87.5% improvement in oral health, and a reduction in dental caries [14].

Discussion

In this review study, the effectiveness of parental education on fissure sealant therapy and caries prevention of the first permanent posterior teeth in children aged 6 to 9 years was evaluated. Despite the importance of oral health, especially in children, and the numerous guidelines in this area, interventional studies in this field are insufficient. In the present study, 7 interventional studies were reviewed.

Evidence shows that educational interventions can have positive effects on fissure sealant therapy [13]. In this regard, intervention in the form of lecture was relatively more

effective in performing fissure sealant therapy than intervention with pamphlets. This finding may be due to the positive impact of face-to-face training. Based on the trans-theoretical model, knowledge is a prerequisite for behavior change [18]. Acquiring knowledge is part of the behavior change process. Knowledge enhancement and designing programs according to the needs of the participants can improve their practice with respect to fissure sealant therapy. In a study by Eslamipour and Zabihi [13], educational intervention improved the knowledge and practice of fissure sealant therapy.

Amiri Tehranizadeh et al. showed that although fissure sealant therapy alone decreased occlusal caries, but it was less successful than other programs including health education and follow-up care [14]. Einollahzadeh et al. [8] showed that education had a positive effect on fissure sealant therapy. Bahmani et al. [17] found that educational interventions had a positive effect on increasing behavioral intention. In their study, distance education by sending leaflets and social networks improved attitude, behavioral norms, perceived behavioral control, and behavioral intentions of the parents. Due to the advances of the communication technology and the use of educational videos and new communication tools, distance education was used in their study [17]. Peyman and Samiee Roudi [15] demonstrated that education had a positive effect on increasing the use of preventive strategies. Shirzad et al. [12] indicated that oral health education of mothers and teachers had a positive effect on promotion of oral health. In a number of studies, planned behavior theory was used as a theoretical framework for conduct, behavior, attitude, subjective norm, perceived behavioral control, and behavioral intention [12, 15]. Planned behavior theory is one of the most widely used models of health education, and evidence shows

that training and interventions based on this theory have been effective in promoting health behaviors [19-22]. The use of appropriate educational content, correct information from appropriate sources to increase knowledge, and social support of participants have a positive impact on education. The high cost of dentistry is one of the main reasons for the failure of programs in this field [13]. Thus, government support by covering dental services in this area can be effective. Another reason is that parents do not have enough time, which is probably due to their lack of awareness. The child's fear of dentistry is another reason for the failure of such programs [16]. It is recommended that parents receive the necessary training to prepare their children for dental services. In the control groups, the most common reasons for failure were the lack of sufficient information about fissure sealants and strategies to prevent dental caries [13, 15]. Therefore, training and educational interventions are required. The World Health Organization emphasizes on the implementation of educational programs on behaviors that enhance oral health. Also, due to poor performance of children in the field of oral healthcare, emphasis has been placed on educating their parents, especially mothers [17]. Parents play an important and effective role in socialization, personal health, and development of confidence in children [8].

Therefore, educating parents based on the existing evidence in performing fissure sealants can be an important step in preventing dental caries. In general, it may be concluded that the knowledge and attitude about the prevention of dental caries and fissure sealant therapy in children in the community are lower than the standards, and educational interventions, especially by the use of educational models can be effective in increasing awareness and improving the attitude of the parents towards fissure sealants.

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